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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): HSJ920010039US1

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]

on January 31, 2006

Signature _____

Typed or printed name Patricia Beilmann

Application Number	Filed
10/084,845	February 26, 2002

First Named Inventor: Mustafa Pinarbasi

Art Unit	Examiner
2652	Davis, David Donald

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- [ ] applicant/inventor.
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- [x] attorney or agent of record. Registration number 28,852
- [ ] attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

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January 31, 2006
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

- [x] *Total of 1 forms are submitted.

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Claims 1-38 are pending, in which claims 1, 8, 15 and 22 are independent claims, and claims 29-38 are withdrawn. Independent claims 1 and 8 are the more significant independent claims for the purpose of this brief, and they are discussed in detail herein; independent claims 15 and 22 mirror claims 1 and 8 respectively.

Applicant's invention relates to features of a magnetoresistive sensor of a magnetic head. Specifically, the Applicant's magnetoresistive sensor includes a PtMn antiferromagnetic layer and the invention specifically relates to the composition and surface characteristics of the seed layer upon which the PtMn antiferromagnetic layer is deposited. Particularly, Applicant's invention is the use of an Si seed layer (claim 1), and more specifically (claim 8) an Si seed layer having an upper surface "having a crystallographic surface that differs from the upper crystallographic surface of a deposited Si seed layer, ..."

Advantageous results of this invention are described in the specification, such as in Table I, column "Fig. 4" on page 11, and the discussion on P. 11, line 10 to page 14, line 2, in using a Si seed layer in place of a tantalum seed layer for the PtMn antiferromagnetic layer. Still further advantageous results are described in the specification where the crystallographic surface of the Si seed layer "differs from" a deposited Si seed layer for the PtMn antiferromagnetic layer, as in Table I, column "Fig. 5" on page 11, and the discussion on P. 11, line 10 to page 12, line 15.

Independent claims 1 and 8 are as follows:

1. A magnetic head including a spin valve sensor comprising:
a magnetic shield layer (S1) being fabricated above a substrate base;
a first electrical insulation layer (G1) being fabricated above said S1 layer;
a spin valve sensor structure being disposed above said G1 layer;
wherein said spin valve sensor structure includes a seed layer being fabricated above said G1 layer, a PtMn layer being disposed above said seed layer and at least one pinned magnetic layer and at least one free magnetic layer being disposed above said PtMn layer; and
wherein **said seed layer includes** an Al_2O_3 sublayer, an NiMnO sublayer, and **an Si sublayer, and wherein said PtMn layer is disposed upon said Si sublayer.** (Emphasis added)

8. A magnetic head including a spin valve sensor comprising:
a magnetic shield layer (S1) being fabricated above a substrate base;
a first electrical insulation layer (G1) being fabricated above said S1 layer;

a spin valve sensor structure being disposed above said G1 layer;

wherein said spin valve sensor structure includes a seed layer being fabricated above said G1 layer, **a PtMn layer** being disposed above said seed layer and at least one pinned magnetic layer and at least one free magnetic layer being disposed above said PtMn layer; and

wherein said seed layer has an upper surface comprised of Si having a crystallographic surface that differs from the upper crystallographic surface of a deposited Si seed layer, and wherein said PtMn layer is disposed upon said surface of said Si seed layer. (Emphasis added)

The rejection is based upon "Applicant's Admitted Prior Art" (AAPA) in view of Chen et al. U.S. 6,183,859.

In pertinent part, the rejection states:

"AAPA, however, is silent as to a sublayer of the seed layer being Si. AAPA is also silent as to the seed sublayer being fabricated to have a thickness of approximately 20 Angstroms and the PtMn layer having a thickness of approximately 120 Angstroms. Chen et al discloses in the paragraph bridging columns 3 and 4 a sublayer of a seed layer being either Ta or Si, which includes a crystalline form differing from a deposited Si seed layer. Emphasis added.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to substitute the Ta layer of AAPA with a Si layer as taught by Chen et al. The rationale is as follows: one of ordinary skill in the art at the time the invention was made would have been motivated to substitute a Ta layer with a Si layer, which is well within the purview of a skilled artisan and absent an unobvious result, because the two layers are art recognized equivalents."

Applicant's admitted prior art (AAPA) is a typical magnetoresistive sensor having a PtMn antiferromagnetic layer, where the antiferromagnetic layer is fabricated upon a deposited tantalum seed layer.

Chen '859 teaches the fabrication of a magnetic tunnel junction sensor that includes an aluminum barrier layer, and Chen is directed to the seed layer of the aluminum barrier layer. Chen does not mention the existence or properties of a PtMn antiferromagnetic layer nor any seed layer that might be used therewith.

Chen discusses the seed layer that might be used in fabricating the aluminum barrier layer of its magnetic tunnel junction sensor. In this regard, Chen teaches that a deposited tantalum layer and a deposited silicon layer may be used interchangeably in fabricating the aluminum barrier layer. Contrary to the statements in the rejection (above), Chen only teaches the use of

deposited seed layers, and nothing regarding an Si seed layer having a surface that differs from a deposited Si seed layer surface (this is significant regarding the limitations in claim 8).

Applicant urges that the rejection of independent claims 1 and 8 (as well as the respectively similar independent claims 15 and 22) should be withdrawn for the following reasons:

1. Applicant's admitted prior art (AAPA) does not indicate that there is any problem associated with the PtMn antiferromagnetic layer that is fabricated upon a deposited tantalum seed layer, and therefore provides no motivation to seek alternative seed layers.

2. Chen '859 teaches nothing with regard to the seed layer that may be used advantageously in fabricating a PtMn antiferromagnetic layer of a magnetoresistive sensor. Chen teaches seed layers for an aluminum barrier layer of a magnetic tunnel junction sensor.

3. Chen does not teach that it is advantageous to use a deposited Si seed layer in place of a deposited tantalum seed layer in fabricating an aluminum barrier layer of a magnetic tunnel sensing sensor. Chen merely teaches that they are interchangeable.

4. Chen teaches nothing regarding the advantageous use of other than deposited seed layers; that is, particularly, an Si seed layer having an upper surface that differs from a deposited Si seed layer upper surface.

Particularly, regarding independent claim 1, based on the above, Applicant urges that there is no teaching or suggestion in the prior art that an improved magnetoresistive sensor may be obtained by fabricating a PtMn antiferromagnetic layer upon an Si seed layer rather than a Ta seed layer. AAPA doesn't suggest this and Chen doesn't suggest it. The magnetic and crystallographic properties of a PtMn ferromagnetic layer differ greatly from those of an aluminum barrier layer, and Applicant submits that a seed layer that is advantageous for one provides no teaching about the other. Specifically, there is no motivation expressed in the prior art for combining these teachings of these references, and it is thus not obvious to one skilled in the art, based upon the teachings of the prior art, to combine the references as has been done in formulating the grounds of these rejections.

Regarding independent claim 8, Applicant argues that there is no teaching or suggestion in the prior art that an improved magnetoresistive sensor may be obtained by fabricating a PtMn antiferromagnetic layer upon an Si seed layer that has a crystallographic surface that differs from the upper crystallographic surface of a deposited Si seed layer. Specifically, there is no motivation expressed in the prior art for combining the teachings of these references (and

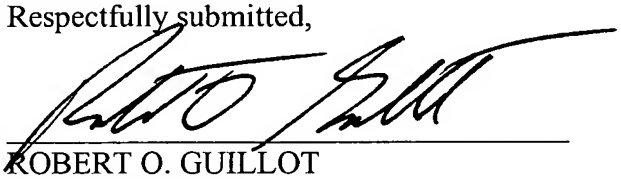
significantly there is no teaching in either reference of this limitation), and it is thus not obvious to one skilled in the art, based upon the teachings of the prior art, to combine the references as has been done in formulating the grounds of these rejections.

The pertinent limitations of independent claim 15 mirror those of independent claim 1, and the pertinent limitation of independent claim 22 mirror those of independent claim 8. Applicant therefore respectfully submits that independent claims 1 8, 15 and 22 are allowable in that they recite limitations not taught by or obvious from the cited prior art.

With regard to dependent claims 2-7, 9-14, 16-21 and 23-28 Applicant respectfully submits that these claims are allowable in that they depend, either directly or indirectly from an allowable base claim.

Dated: January 31, 2006

Respectfully submitted,



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